

REMARKS

Claims 1 and 3-46 are pending in the present application. Claims 18 - 29 stand withdrawn from consideration. Reconsideration is respectfully requested.

Claim Rejection, 35 USC 112, 2nd Paragraph

As to the matter of the issues raised by the Examiner in the first two paragraphs of page 5 of the Office Action, Claims 1, 17 and 30 have been amended to remove the term “optional” therefrom. The amendments that have been made, for example, with respect to the term “alkyl,” specifies that the alkyl group having a certain range of carbon atom content is either an essential alkyl or a substituted alkyl group. Further, the term “intermediate” has been eliminated from Claim 17.

As to the matter of the terms “photolabile protective group” and “protective group,” the terms have been deleted from Claims 1, 8 - 11 and 30. As such, any indefiniteness attributable to the use of these terms in the claims has been removed. However, evidence that these terms are not indefinite and have meaning to those of skill in the art, is found, for instance, at column 2, lines 5-8 and column 26, lines 49-56 of the Fodor et al patent. Accordingly, withdrawal of the stated grounds of rejection is respectfully requested.

Claim Rejections, 35 USC 112, First and 2nd Paragraphs

Applicants do not concur that the indefiniteness issues and lack of enabling support issues that have been raised with respect to the terms “a functional group useful in oligonucleotide synthesis,” “chemically modified,” “analog thereof,” “chemical modifications thereof,” “analogs of deoxyribonucleosides,” ribonucleosides,” “deoxyribonucleosides,” “ribonucleosides,” and “oligonucleotides” are valid criticisms. The terms in question, in fact, are well known and have art recognized meaning. Note, for

instance, that the Pfleiderer et al patent (cited of record in the present case), which has a 102(e) date of August 9, 1996, is entitled “nucleoside derivatives with photolabile protective groups.” The title shows that the meanings of certain of the presently criticized terms are known by those of skill in the art. Note also that Fodor et al (filing date of February 16, 1995) at column 26, lines 29-30 uses a subheading of “use of photoremovable groups during solid phase synthesis of oligonucleotides” which also demonstrates that those of skill in the art know the meanings of certain terms held in question by the Examiner. Pfleiderer et al in Claim 1 describes a “nucleoside derivative” which has a “functional group useful in oligonucleotide synthesis” in the form of a phosphoramidite group at position R⁵. The formula of the nucleoside derivatives of Pfleiderer et al also describes examples of substituent B which include the usual ribofuranose and deoxyribofuranose moieties and “chemical modifications thereof.” Because of the familiarity to the skilled artisan of the terms and their scope in question in the specification and claims, and because the specification is believed to be enabling and the claims definite in the use of these terms, the grounds of rejection that have been raised are believed overcome.

Applicants also maintain that their specification is entirely satisfactory on the basis of the definition of terms employed in the case as set forth on pages 11-13 of the text. The subject matter here is clearly sufficient to give meaning to the terms mentioned in view of examples given in each definition. The definitions do not have to be exhaustive in their reach. What they do state is more than adequate for the skilled artisan to know and understand the intended meaning of each of the terms. Accordingly, withdrawal of the stated grounds of rejection is respectfully requested.

Claim Rejection, 35 USC 103

Claims 1, 3, 5 and 7-17 stand rejected based on 35 U.S.C. §103(a) as obvious over Pfleiderer et al in view of Fodor et al, U.S. Patent 5,489,678. This ground of rejection is respectfully traversed.

The Pfleiderer et al patent discloses a compound at the top of column 2 that contains a photolabile protective group in the form of a phenethyl moiety attached to a (deoxy)furanoside moiety by a carbonate group. The photolabile group thus bears similarity to the photolabile group of the presently claimed compound. As acknowledged by the Examiner at page 13, lines 13-15 of the Office Action, the difference between the structure of the presently claimed compound and the photolabile radical disclosed in the reference is at position R² where R² in the patent is a hydrogen atom or a hydroxyl group, while in the presently claimed compound R² is an aryl group, a substituted aryl group, a heteroaryl group, substituted heteroaryl group, an aroyl group, or a substituted aroyl group. Thus, the R² group of the present claims introduces an aromatic group at the R² position. There is no suggestion in the reference that would lead one of skill in the art to replace either the hydrogen atom or the methoxy group at position R² with an aromatic group containing radical.

The Examiner cites the Fodor et al patent in its disclosure of a photolabile group which overall is of a significantly different structure than the photolabile compound that is presently claimed. In fact, to be considered relevant at all, subscript n must have a value of 1. However, the substituted benzyl compound of the carbonate embodiment of the compound is not a phenethyl group. Moreover, the position on the benzene ring para to the nitro group (corresponds to R² of the present claims) is either methoxy or part of a methylenedioxy substituent (at two positions on the benzene ring). Despite the fact that Fodor et al discloses aryl as a type of R¹ and/or R² radical, it is only one among the many types of radicals shown from which substituent R¹ and R² may be chosen. Moreover, if group R¹ in Fodor et al is not

hydrogen, then still a further distinction exists between the presently claimed compound and the photolabile radical shown in the patent which clearly would not lead one of skill in the art to the presently claimed compound. Accordingly, applicants maintain that the combination of the two patents does not suggest the present invention as claimed. Withdrawal of the rejection is respectfully requested.

The Examiner has provided a discussion in the Action of the previously cited Hasan et al document. However, the Action does not indicate a rejection of the claims based on the reference. Is a rejection in view of the disclosure of Hasan et al intended?

Claims 1 and 6 stand rejected based on 35 U.S.C. §103(a) as obvious over Pfleiderer et al in view of Fodor et al, U.S. Patent 5,489,678 and further in view of Berlin, DE 19938092. This ground of rejection is respectfully traversed.

Applicants maintain their position with respect to the Pfleiderer et al and Fodor et al patents as set forth above. Applicants further submit that the deficiencies of the primary references are neither overcome nor improved upon by Berlin. While the reference discloses a derivatized nucleoside of formula I which is a thiocarbonate compound, the photolabile nucleoside disclosed therein nevertheless is quite different structurally from the present compound as claimed. There is no teaching or suggestion of a phenethyl carbonate radical in which the R₅ substituent is aryl, aroyl or heteroaryl, any of which is optionally substituted. Rather, Berlin teaches that substituent R₅, opposite the nitro group, is hydrogen, alkyl (C₁₋₄), alkoxy or methylenedioxy (in part). The photolabile component of the cited Berlin document is only relevant if the value of subscript n is one. The cited combination of the three references does not render Claims 1 and 6 obvious in the meaning of 35 USC 103. Withdrawal of the rejection is respectfully requested.

Claims 30-32 and 34-46 stand rejected based on 35 U.S.C. §103(a) as obvious over Pfleiderer et al in view of Haugland et al, U.S. Patent 5,635,608. This ground of rejection is respectfully traversed.

Applicants maintain their view stated above with regard to the Pfleiderer et al patent. Further, the Haugland et al patent, in disclosing a photolabile group that can be attached to a nucleoside, does not show a phenethyl type of structure that is bonded through a carbonate group to a nucleoside, but rather a benzyl group. Also, although the R¹ substituent of the compound of the patent may be a carboxylate ester group, it is only one of a number of different functional groups for R¹. Moreover, since the same functional groups serve as basis for the selection of groups R¹ and R² of the compound of the patent, it impossible to arrive at the benzene ring substitution pattern of the present claims from the disclosure of the patent. Accordingly, the claims employed in combination do not suggest the present invention.

Withdrawal of the rejection is respectfully requested.

Claims 30 and 33 stand rejected based on 35 U.S.C. §103(a) as obvious over Pfleiderer et al in view of Haugland et al, U.S. Patent 5,635,608 and further in view of Berlin. This ground of rejection is respectfully traversed.

Applicants maintain their position with respect to the Pfleiderer et al and Haugland et al patents as discussed above, that the two cited patents do not suggest the present invention as claimed.

As to Berlin, applicants restate while the reference discloses a derivatized nucleoside of formula I which is a thiocarbonate compound, the photolabile nucleoside disclosed therein nevertheless is quite different structurally from the present compound as claimed. There is no teaching or suggestion of a phenethyl carbonate radical in which the R₅ substituent (reference) is aryl, aroyl or heteroaryl, any of which is optionally substituted. Rather, Berlin teaches that substituent R₅, opposite the nitro group, is hydrogen, alkyl (C₁₋₄), alkoxy or methylenedioxy

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(in part). Moreover, the photolabile component of the cited Berlin document is only relevant if the value of subscript n is one. Accordingly, the cited combination of references is believed overcome and withdrawal of the rejection is respectfully requested.

Applicants respectfully submit that the above-identified application is in condition for allowance. Early notification to this effect is earnestly solicited.

Respectfully submitted,

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